



King's Research Portal

Document Version
Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Bargach, J., Dodson, L., & Farnum, R. L. (2016). Net Change: Harvesting Fog for Resilience in Southwest Morocco. In *Proceedings of the International Conference on Water, Energy & Climate Change (WECC'2016)*
<https://prezi.com/6gantlyalqgp1/dar-si-hmad-wecc-2016/>

Citing this paper

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

General rights

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

Take down policy

If you believe that this document breaches copyright please contact librarypure@kcl.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

Net Change: Harvesting Fog for Resilience in Southwest Morocco

Jamila BARGACH^{1,2}, Leslie DODSON^{3,4}, Rebecca L. FARNUM^{1,5}

¹ Dar Si Hmad for Development, Culture and Education, Agadir, Morocco

² National School of Architecture, Rabat, Morocco

³ Worcester Polytechnic Institute, Worcester, Massachusetts, United States

⁴ Tifawin Institute for Durable Development, Denver, Colorado, United States

⁵ Department of Geography, King's College London, London, United Kingdom

Corresponding author: rebecca.farnum@kcl.ac.uk

INTRODUCTION:

Dar Si Hmad for Development, Education and Culture (DSH) runs one of the world's largest fog collection systems. After a decade-long experimental phase, the project was officially inaugurated in 2015 and now pipes potable running water into the homes of five rural villages in the Anti-Atlas Mountains of Southwest Morocco. Incorporating from its outset user-centric planning and embracing the interrelation between justice, livelihoods, and sustainability, the fog project serves as a case study for the potential of holistic development.

MAIN RESULTS:

One of the saddest realities of climate change is its unequal impact. Already marginalized communities "bear the brunt of environmental degradation" [1]. Vulnerable populations and fragile landscapes intersect to further jeopardize livelihoods. Recognizing this, Dar Si Hmad's fog project is guided by principles of environmental justice, purposefully integrating gendered and pro-poor analyses to generate maximum impact. On their own, fog collection nets are an innovative technological solution to water stress and the environmental uncertainties wrought by climate change, an ancient idea revitalized for modern demands in fog dense areas [2]. By leveraging the trust built over the course of the project's feasibility study, Dar Si Hmad has built a comprehensive development program delivering not only potable water but also literacy and numeracy support, capacity building, and STEM-based education to some of Morocco's most at-risk villages.

Women hold an ancestral role as water guardians in much of the world. Building from ICCD models linking ICT, climate change, and development [3], Dar Si Hmad created a fog monitoring system valorizing this role. Literacy and numeracy trainings in partner villages enable women to govern household supply via SMS message. Expanded literacy capacities have proven useful for much more than capturing fog data, demonstrating the mutual benefits of engaging beneficiaries in the planning and implementation of development projects [4].

Prior to the fog water inauguration, women in partner villages spent up to four hours collecting water every day. Fog water is creating a *de facto* equality of time between the sexes. To ensure women are able to use the newfound time in ways that benefit them and mitigate the potential negative impacts of alterations to local gender norms, a series of capacity building trainings explored agricultural co-operatives as routes to economic empowerment. Sustainable, locally led businesses further boost resilience as communities have access to multiple income sources.

Complementing adult education is the Water School, a hands-on curriculum engaging area youth around issues of water, sustainability, and conservation. Activities combine art, engineering, science, and math to teach societal and natural realities, equipping rural youth to be makers rather than victims of global change.

Additional spin-off projects include WASH trainings improving community health; the installation of eco-friendly toilets reducing disease and helping retain girls in schools; and a fog water fed reforestation program engaging new stakeholders.

Successfully navigating the water, energy, and climate change nexus requires creative approaches to adaptation and development. Dar Si Hmad's fog harvesting project is one such holistic project that might serve as a pedagogical blueprint for applied resilience projects.

KEYWORDS: fog harvesting; water; sustainable development; women's empowerment; environmental education

REFERENCES:

- [1] L Hansen and J Kerr, "The Justice of Water Conservation: NGOs and Civil Society", *Proceedings of Environmental Justice and Global Citizenship*, 2010
- [2] Vicky Marzol, *La captación del agua de la niebla en la isla de Tenerife*, Caja Canarias: Santa Cruz de Tenerife, 2003
- [3] R Heeks and AV Ospina, "ICTs, Climate Change and Development: Themes and Strategic Actions », Centre for Development Informatics, 2012
- [4] Leslie Dodson, *A Foggy Desert: Equitable Information Flow for a Fogwater System in Southwest Morocco*, University of Colorado Boulder, 2014